

STUDIES IN PHILIPPINE JASSOIDEA: II, PHILIPPINE JASSARIA

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FIVE TEXT FIGURES

The present classification of the jassoid insects is one of the most artificial groupings in the Hemiptera. Groupings have been proposed by various authors, in each case based principally on the Jassoidea¹ of a single country or at least of limited regions. We have had these, more or less varied in detail, for Europe, America, India, and Australasia and Polynesia. Any one of these classifications is largely broken down in attempts to use it for the jassoid insects of the world. But very few generic or even family types have been given thorough anatomical study, the bulk of the genera and even higher groups having been so incompletely described, that their arrangement in a common system, at this time, is next to impossible. Adequate anatomical studies in this superfamily will surely bring about a more natural arrangement, as it has recently done in the Psylloidea. For example, it may justly be said that we know next to nothing of the composition of the thorax of the jassoid insects. Some observations I have made on pleural and sternal sclerites in certain forms indicate that this will be a fruitful subject for study. I have labored for many years simply to bring together enough material from all regions to gain some elementary idea of the broader groupings possible. I estimate that more undescribed species now exist in collections than all previously made known by all authors. It may be imagined how all this coming work will modify our present conceptions of genera. Some of the existing "genera" will completely disappear in this flood of species, while many new genera will have to be erected, this in its turn widely modifying family limits.

¹ It seems that the time is soon coming when the Homoptera by general consent will be divided into the superfamilies Fulgoroidea, Cicadoidea, Cercopioidea, Membracioidea, Jassoidea, Psylloidea, and Coccidoidea. These can then be divided into numerous natural families. Only special students of the group are aware of the enormous extent of the Homoptera, even as imperfectly known as it is at present, and these students, at least, welcome the greater clarity and simplicity possible in the recognition of more numerous families.

At present I am grouping my material in seven families: Ledridæ, Stenocotidæ, Ulopidæ, Tettigoniellidæ, Jassidæ, Koebeliidæ, and Bythoscopidæ. The Ledridæ, if restricted, form a fairly homogeneous group. The Stenocotidæ include the Stenocotinæ, Megophthalminæ (formerly family Paropiidæ), and Sigenoretiinæ. The Ulopidæ form a passage to the next family. The Tettigoniellidæ include the Hylicinæ, Gyponinæ, Penthiminæ, and Tettigoniellinæ (with the tribes Ciccini, Tettigoniellini, and Errhomenini). The extensive family Jassidæ² includes the Eupelicinæ and Jassinæ; the latter subfamily I divide into 6 tribes: Acocephalini, Cephalini (with the divisions Cephalusaria and Hecalusaria), Phrynomorphini (formerly Athysanini) (with the tribes Stégelytraria, Tartessusaria, Selenocephalaria, Phrynomorpharia, and Limotettixaria), Balcluthini (formerly Gnathodini), Eupterygini (formerly Typhlocybini), and Jassini (with the tribes Xestocephalaria and Jassaria). The Koebeliidæ represent an anomalous group showing a strange mixture of relationships. The Bythoscopidæ should be separated into Bythoscopinæ and Eurymelinæ (if included at all). The latter subfamily, having strong membracid affinities, should be examined as to its relationships with the æthalionids.

Taking up the Jassini, we find the tribe, throughout, readily recognizable by the reduced venation, distinctive form of head and thorax, and other general characters. It seems that Xestocephalus should find a place here. Its form, venation, and position of ocelli all find close analogues in this tribe. The genus *Macroceratogonia* of Kirkaldy indubitably belongs in this tribe and is closely related to *Palicus* and *Neocoelidea*. It has nothing clearly to distinguish it but the higher position of the antennæ, and this character is not of tribal value.

The division *Thagriaria* of Distant seems to be unnecessary, since there are some quite intermediate forms. The logical following out of such a separation would be the recognition, among these genera, of a number of other groups of equal value and all difficult of definition. In Distant's synopsis of genera the diagnostic character used to separate *Guliga* has only a specific value among these insects. Also his alternative group characters for separating *Jassus-Arya* from *Kunasia-Myittana* are both amply

² The use of the family name Jassidæ by Stebbing (Amphipoda: Gammaridea) [Das Tierreich 21, 8, 647, 739], for a family of Amphipoda, is untenable. *Jassus* Fabr., as a genus of the Homoptera, dates from 1803, while *Jassa* Leach of Amphipoda dates from 1814. Fieber had used this family name in the Homoptera in 1866.

represented in endless intergrading conditions in American species of *Jassus*. In the several hundred tropical American species of the genus *Jassus* we might easily separate a large number of genera as good as *Guliga* of Distant. A number of the genera included in this tribe are so described that they cannot be understood without further study and description. For instance, in Kirkaldy's description of *Muirella* he mentions a number of characters not at all generically diagnostic, but fails to mention if an appendix is present or not, and this point is not clearly shown in the accompanying cut. In the same genus he describes the vertex as two and one-half times as long as wide at base, but his figure shows it not twice as long as wide. In this case I have followed the figure.³

A provisional synopsis—confessedly imperfect—of the genera of this division will indicate some of the relationships mentioned above. In many respects this synopsis is too artificial, but this cannot be avoided with our incomplete knowledge of some of the genera. For instance, the median pronotal carina should not be used as a primary character, and *Thagria* should fall near *Tharra* and *Soortana*.

*Key to the genera of the division Jassaria.*⁴

- a¹. Fore femora and tibiæ normal.
- b¹. Pronotum not medially carinate or only obsoletely so near anterior margin.
- c¹. Eyes not adjoining front in facial view.
- d¹. Scutellum minute..... Tinobregmus Van D.
- d². Scutellum normal to large.
- e¹. Antennal scrobes abnormally high on face, above level of eyes in facial view; antennæ longer than body.
Macroceratogonia Kirk.
- e². Antennal scrobes near inner lower angle of eyes.
- f¹. Wings with two apical cells.
- g¹. Clypeus strongly umbonate..... Paracoelidea Baker.
- g². Clypeus plane..... Neocoelidea Baker.
- f². Wings with three apical cells.
- g¹. Tegmina without an appendix..... Palicus Stål.
- g². Tegmina with an appendix.
- h¹. Vertex more or less elongately, usually angularly produced, always longer than width between eyes and usually strongly foveate; front usually very long and narrow.

³ A specimen of *Muirella*, received from Muir since the above was written, does not agree with either the description or figure, the length of vertex being slightly more than twice interocular width.

⁴ Here should also be included the *Doda* of Distant and apparently the *Toba* of Schmidt.

- v*¹. Vertex but little longer than broad, acutely pointed anteriorly.
- j*¹. Front very long and narrow, but without angulate ridge above; ocelli near apex of vertex; tegmina truncate apically..... Varta Dist.
- j*². Front not long and narrow, but with an angulate ridge above; ocelli not near apex of vertex; tegmina rounded apically..... Sabima Dist.
- v*². Vertex little less than twice as long as broad, or longer.
- j*¹. Vertex with anteocular portion far longer than interocular.
- k*¹. Anteocular portion of vertex with lateral margins in line with outer margins of eyes.
- l*¹. Pronotum and vertex medially longitudinally carinate; margins of anteocular portion of vertex sinuate; clypeus narrowed to tip.
Dussana Dist.
- l*². Pronotum and vertex noncarinate; margins of anteocular portion of vertex straight; clypeus broadened at tip and marginate.
Muirella Kirk.
- k*². Anteocular portion of vertex greatly contracted within outer eye margins; clypeus narrowed to tip..... Dharmma Dist.
- j*². Vertex with anteocular portion far shorter than interocular.
- k*¹. Front with sides strongly sinuate and distinctly broadened above; lateral carinate margins of vertex parallel as far as to base of vertex, anteriorly curved on to the temples next the eye; front more or less distinctly medially carinate; scutellum longer than vertex.... Tharra Kirk.
- k*². Front with sides straight, scarcely broadened above; lateral carinate margins of vertex suddenly converging posteriorly and "terminating in a sulcate process;" front noncarinate; scutellum about as long as vertex..... Soortana Dist.
- h*². Vertex but little and very obtusely produced in front of eyes, commonly about as long as broad, never much longer than broad between eyes, sometimes much less.
- v*¹. Head distinctly narrower than pronotum.
- j*¹. Head about half the width of pronotum and not as wide as scutellum; vertex about as long as width between eyes, subangulate anteriorly and smooth, noncarinate; ocelli very near eyes.... Placidus Dist.
- j*². Head always wider than half pronotum and wider than scutellum; vertex very obtuse and usually carinate medially or laterally or both; ocelli very near eyes.
- k*¹. Face broader than long; vertex broader than long and far shorter than pronotum; tegmina with 4 apical cells..... Kunasia Dist.

- k*². Face always far longer than broad; vertex usually as long as, or longer than, broad; tegmina with 5 apical cells.
- l*¹. Vertex subangular anteriorly; clypeus medially carinate Guliga Dist.⁵
- l*². Vertex very obtuse anteriorly; clypeus usually noncarinate, except occasionally toward base.
Jassus Fabr.
- i*². Head about as wide as pronotum.
- j*¹. Pronotum slightly emarginate behind; clypeus broadened to tip; tegmina with 2 subapical cells.
Arya Dist.
- j*². Pronotum deeply emarginate behind; clypeus narrowed to tip; tegmina with 1 subapical cell.
Myittana Dist.
- c*¹. Eyes broadly adjoining front in facial view; vertex foveate, short angulate anteriorly; pronotum with anterior margin acutely produced between the eyes..... Pugla Dist.
- b*². Pronotum distinctly medially carinate; vertex laterally carinate, twice as long as width between eyes, apically acute, antecular portion longer than interocular.
- c*¹. Scutellum longer than pronotum; antecular portion of vertex with subangulated lateral margins; lateral carinæ of vertex widely separated at base and apex..... Thagria Mel.
- c*². Scutellum shorter than pronotum; antecular portion of vertex with nearly straight lateral margins; lateral carinæ of vertex converging at base and apex..... Mukwana Dist.
- a*². Fore femora or tibiæ foliaceous or curved.
- b*¹. Fore femora normal, fore tibiæ curved..... Terulia Stål.
- b*². Fore femora dilated..... Gabrita Kirk. (Petalopoda Spang.)

Genus JASSUS Fabricus

So far as known to me, there are 4 common species of *Jassus* in Luzon.⁶ Three of these species were described by Stål and are easily recognized from his descriptions. Apparently the rostrum is distinctly longer in *J. philippinensis* than in *obscurus* or *conspersus*, but it is not clear what Stål refers to as the "last segment," since the divisions of the joints are in part quite obscure.

Drawings of a full-face view in these species does not show at all the exact form of the front. At the antenna the frontal margin is incurved into the basin of the antennal scrobe and there acutely angled. Along the general line of the margin, on the side of the disk of the front at this position, is a sharp

⁵ As will be noted by students of this group, the separation of *Guliga* on the characters given is wholly inadequate to establish the genus.

⁶ A number of other species from the southern islands will be reported on later.

carina, which gives in a remarkable fashion an appearance in the front view of a continuous lateral margin. This is shown in the figures of the accompanying cuts.

The species group out as Stål suggests, even when various other important characters besides those used by him are taken into consideration. The upper extension of the lora furnishes a character peculiar in the two groups of species. Less clear, but still characteristic, is the form of the lower margin of the antennal cavity between the lora and the eye. In *Jassus obscurus* and *J. conspersus* this is more or less distinctly carinately margined and is slightly curved toward the antenna, making the lower point subacute where it joins the lora. In *J. luzonensis* and *J. philippinensis* there is no carina, the lower margin of the cavity being curved away from the antenna, making the cavity broadly rounded below. *Jassus dubia* Walk., described from the Philippines, is unknown to me, and unrecognizable on account of the inadequate description.

Synopsis of species of Jassus known from Luzon.

- a*¹. Vertex longer than width between eyes and longer than pronotum; clypeus very strongly broadened apically; tegmina without a costal transparent spot; acute upper tip of lora falling far short of reaching antenna.
- b*¹. Pronotum and tegmina clear black, vertex piceous; face clear dark brown; hind margin of last ventral segment of female truncate medially, slightly incurved laterally..... *obscurus* Stål.
- b*². Pronotum and tegmina brown and thickly yellow granulate, the vertex yellow; front yellow, laterally brownish to reddish; hind margin of last ventral segment of female subtruncate medially, very strongly and suddenly bisinuate laterally..... *conspersus* Stål.
- a*². Vertex shorter than width between eyes and shorter than pronotum; clypeus not very strongly broadened apically; tegmina with a costal transparent spot; acute upper tip of lora reaching antenna.
- b*¹. Tegmina thickly yellowish granulate and without discal yellowish spots; front brown, thickly yellow-dotted; ocelli nearer to eyes than to median line; scutellum small; hind margin of last ventral segment of female strongly produced, medially broadly emarginate, angles of emargination acute..... *luzonensis* sp. nov.
- b*². Tegmina without yellowish granulations, but with several discal yellowish spots; front brownish, lower two thirds medially yellowish; ocelli nearer to median line than to eyes; scutellum very large; hind margin of last ventral segment gently sinuate.
philippinensis Stål.

Jassus obscurus Stål.

This large species, with tegmina unicolorous blackish, and with under parts unicolorous brownish, is the most readily recognized species in this region. The propleura, below the carina, presents a remarkable character in that the anterior

half is finely shagreened, the posterior half being long-ovally and sharply depressed, almost foveate; this area rugose. Vertex with a strong sharp continuous median carina, and with deep interocular depressions on either side of median carina, leaving strong folds next eye, which, passing forward, bend suddenly from eyes to apex of vertex, and posteriorly gradually converge along lines of eye margins to posterior margins of vertex near the median carina. Pronotum and anterior area of scutellum tuberculate, but not at all rugose; posterior area of scutellum distinctly longer than wide and obscurely transversely wrinkled. Tegmina frequently with a whitish bloom.

LUZON, Laguna, Mount Maquiling (*Baker*). Frequent, and apparently a forest inhabitant.

Jassus conspersus Stål.

This species is well marked by the numerous yellowish dots and the reddish or brownish lateral stripes of the front.

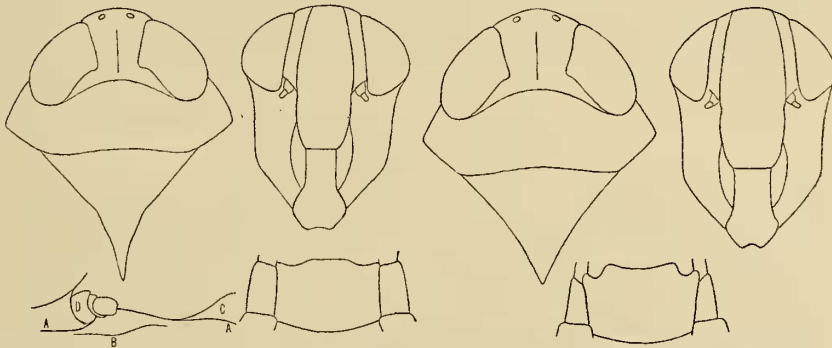


FIG. 1. *Jassus obscurus* Stål. A—A, lateral margin of front; B, carina forming false frontal margin; C, lora; D, antenna.

FIG. 2. *Jassus conspersus* Stål.

The propleuræ below the carinæ are only slightly concave posteriorly where they are narrowly wrinkled, the remainder of the surface being thickly coarsely shagreened. Structure of vertex totally different from that of *J. obscurus*. The median carina becomes obsolete anteriorly; the lateral folds are only distinct posteriorly where they join the posterior margin distant from median carina; disk of vertex anteriorly not at all or only slightly depressed, but with strong oblique rugæ which converge at apex of vertex; disk posteriorly with 2 depressions, each midway between carina and lateral fold. Pronotum and anterior fold of scutellum with large tubercles, and the former also transversely subobsoletely wrinkled. Tegmina frequently with a strong greenish tinge.

LUZON, Laguna, Los Baños and Mount Maquiling (*Baker*).
Abundant.

Jassus luzonensis sp. nov.

Vertex and fore and middle legs yellowish, remainder dark brown. Pleuræ black, borders of abdominal tergites narrowly yellowish. Wings smoky. Front and basal portion of clypeus with numerous small round yellowish dots. Pronotum strongly yellow tuberculate. Tegmina with numerous yellow interruptions on the veins; membrane within the cells basally, with a few small irregular dots. A small yellowish dash at two thirds of the costal margin and a more indistinct yellowish mark across the 2 outer apical cells. Length, ♂ 7, ♀ 8 mm.

Clypeus but little expanded apically, the apical margin depressed and roughened. Front, length not twice its greatest

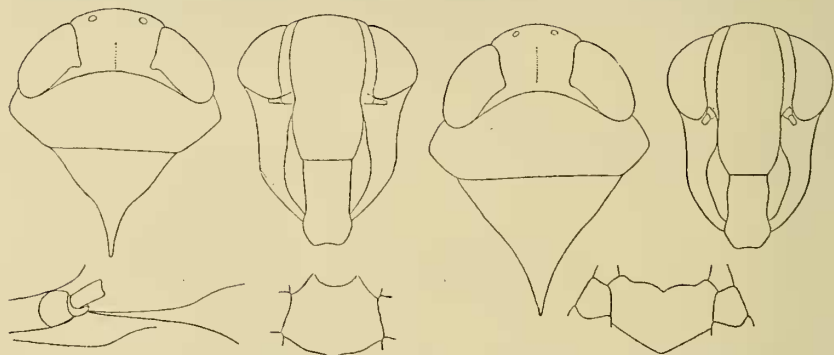


FIG. 3. *Jassus luzonensis* sp. nov.

FIG. 4. *Jassus philippinensis* Stål.

width, its surface, with that of clypeus except apical margin, coarsely evenly shagreened. Loræ acutely extended above to antennæ, their surface, with that of genæ, minutely rugose. Vertex shorter and broader than in other Philippine species, length but little less than width between eyes; surface broadly depressed on either side, without distinct ocular fold; median carina double, forming a very slender median sulcus; surface rugose, the rugosities, anteriorly, converging obliquely to tip. Ocelli slightly nearer to eyes than to median line. Width of pronotum two and two thirds its length, with a vestige of a median carina anteriorly, strongly tuberculate but without rugæ; lateral carina somewhat incomplete, below this shagreened except the slightly roughened posterior border. Surface of scutellum slightly roughened and with a few yellowish dots. Hind margin of last ventral segment of female somewhat ex-

tended, slightly emarginate between 2 acute projections, lateral to which the margin is suddenly oblique.

LUZON, Laguna, Los Baños and Mount Maquiling (*Baker*).

The splitting of the median carina of vertex, so distinct in this species, is very faintly suggested in *J. conspersus*.

Jassus philippinensis Stål.

Easily recognized by the large pale transverse spots on apical two thirds of tegmina, which, however, entirely lacks yellowish interruptions on the veins. Face brownish above; below, with fore and middle legs, yellowish. The males are uniformly a little paler in general color than the females. The propleuræ are largely shagreened and have 2 small smoother areas posteriorly. Structure of vertex very similar to that of *J. luzonensis*, but here the central raised sulcus is still more marked and much wider posteriorly, and the rugæ on the surface of vertex are stronger. The tubercles on the pronotum are weak, their color running together in transverse groups, the surface between not rugose. Scutellum nearly smooth. Tegmina very smooth.

LUZON, Laguna, Los Baños and Mount Maquiling (*Baker*). Abundant.

Genus THARRA Kirkaldy

On the mossy-forest summit of Mount Maquiling at 3,600 feet altitude we find abundant a very peculiar member of this division, evidently not a true *Jassus*, which I at first took to represent a new genus near *Soortana* of Distant. I had been unable to get any clear understanding of the *Tharra* of Kirkaldy, but it appears plain now that this species pertains to that generic group. The venational characters given for the genus by Kirkaldy are without generic significance. A figure published by the Hawaiian Sugar Planters' Association⁷ is apparently intended to illustrate a member of this genus, although I can find no reference to it in the text. The figure, however, shows well the remarkable structure of the head. The species previously described are all Fijian and Australian, and it is a most interesting discovery to find a representative in Luzon. Others will doubtless be found in intervening islands.⁸ Evidently our species closely resembles *T. labena*, the type of the genus, from Queensland.

⁷ Bull. Hawaiian Sugar Plant. Assoc., Div. Ent. (1907), 3, Pl. II, fig. 16.

⁸ Collection made since the above was written show peculiar species to exist in Negros and Mindanao, and others in Luzon.

Tharra carinata sp. nov.

Pronotum pale brownish, with minute indistinct darker markings. Scutellum, vertex, face, sternum, and legs, pale yellowish; scutellum with basal angles, two discal spots, and incised transverse line, dark; point of vertex carmine; antennal scrobes, band across anterior coxæ, and hind tarsi, dark. Abdomen yellowish, the incisures above, and all below apically, dark. Tegmina brown, tip narrowly whitish translucent, the veins red, nearly every cell with a small irregular whitish translucent spot on its disk. Costal margin with 3 translucent spots on its basal half and a much larger costal spot on its apical half. Length, ♂ 6, ♀ 6.5 millimeters.

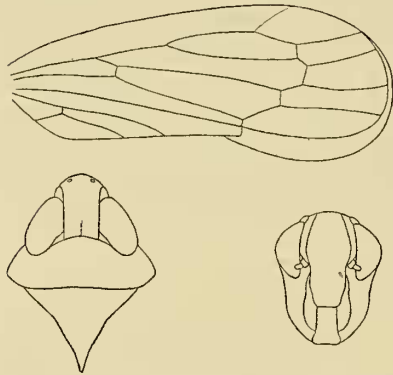


FIG 5. *Tharra carinata* sp. nov.

Clypeus slightly expanded distally, the apex not emarginate. The whole face is evenly finely shagreened. Front a little more than twice its greatest width, medially finely but distinctly carinate. Loræ suddenly acutely extended above but not reaching antennæ. Length of vertex one and three fourths times width between eyes, with sharp and high lateral carinæ, which are nearly parallel and anteriorly curve down on to the

temples, reaching the antennal scrobes; the median carina is distinct only posteriorly, disk depressed, its surface strongly sublongitudinally rugose, anteriorly the rugæ bend obliquely toward the apex. Ocelli nearer to median line than to eyes. Pronotum nearly three times wider than long, not at all tuberculate, but minutely rather sparsely pitted and roughened, and with a subobsolete median carina. Lateral carina of pronotum entire, below this shining, the upper part minutely roughened. Scutellum shagreened nearly throughout. Hind margin of last ventral segment of female truncate.

LUZON, Laguna, summit of Mount Maquiling (*Baker*).